

June 19, 1962

Nelson H. Kraeft, M.D.
1212 North Magnolia Drive
Tallahassee, Florida

Dear Dr. Kraeft:

First, let me apologize for the tardiness of this reply to your gracious letter of May 26th, 1962. I have been out of town and have just recently returned to a rather formidable pile of correspondence, a problem I am sure you are not unfamiliar with.

The case you described in your letter is interesting. We now have implanted approximately 27 pacemakers and have not had any personal experience where the electrodes have stimulated the phrenic nerve. I know of no one else who has had such an experience. It certainly appears to be a problem which others will run into in the future. If one has the electrodes close enough to the phrenic nerve it would seem that enough electrical energy would spill over to stimulate this structure. The suggestion you offered about placing a sponge from some material such as gelfoam or surgicell, seems like a reasonable approach to the problem, even though you are quite right that it would probably promote excess scarring. I don't believe that this would cause a great deal of harm. We have done some experiments in the dog lab, where we have tried to stimulate the phrenic over long periods of time and found that this was not possible after continuous stimulation for 2 or 3 weeks so your solution to the problem is probably the most effective one. I believe that by the time the phrenic nerve has regenerated, that enough scar tissue will form around the phrenic nerve so as to completely insulate this structure from the source of the stimulation.

Thank you for taking the time to write to me about this interesting problem associated with the pacemaker.

If there is any way I can be of help, please let me know.

Sincerely yours,

AK/ea

Adrian Kantrowitz, M.D.